

SUMMARY TABLE FOR EVALUATION OF DRINKING WATER QUALITY GOALS

TO: California Urban Water Agencies Central Valley Drinking Water Program Work Group
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Provided below is a summary of the key information found related to the drinking water quality goals research for the Central Valley Drinking Water Program. Supporting materials and more detailed information are provided in the four attached Technical Memoranda.

Constituent	Drinking Water Regulation	Central Valley Regional Board Source Water Regulation	Related Goals or Policies by Other Agencies
Total Organic Carbon (TOC)	Treatment technique with variable removal requirements when source or treated water TOC > 2 mg/L (Stage 1 Disinfectants/Disinfection By Products Rule).	No water quality objective - may be impacted by objective for color.	British Columbia has a guideline of 4 mg/L for TOC in sources used for drinking water. No other Regional Boards (RBs) or other agencies currently have an objective. The Santa Ana RB is developing a TOC objective related to groundwater recharge with effluent dominated waters. DPH draft groundwater regulations.
Dissolved Organic Carbon (DOC)	Not directly regulated, indirectly through specific ultraviolet light absorbance (SUVA) calculation. TOC removal required if source or treated water SUVA > 2 L/mg-m (Stage 1 D/DBPR).	No direct water quality objective, may be impacted by objective for color.	No other RBs or agencies currently have a direct objective.

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Bromide	No standard, is a precursor to disinfection by-products.	No direct water quality objective.	British Columbia has a working guide for bromide of 50 µg/L, based on the CALFED target. Florida developed criteria of 100 µg/L bromide based on fisheries impacts. New York has set a guidance value for bromide (2,000 µg/L) for surface water and groundwater. No other RBs have an objective.
Total Dissolved Solids (TDS)	Secondary Maximum Contaminant Level (MCL) with recommended level of 500 mg/L and an upper limit of 1,000 mg/L.	Water quality objective for municipal water supply (MUN) beneficial use set at recommended secondary MCL. More stringent site-specific objectives based on other beneficial uses.	Most RBs and other agencies have the same MUN objective as the Central Valley RB. Some RBs and states do not allow discharges to increase the salinity of the source water. This typically results in implementation of site-specific objectives.
Electrical Conductivity (EC)	Secondary MCL with recommended level of 900 mg/L and an upper limit of 1,600 mg/L.	Water quality objective for MUN beneficial use set at recommended secondary MCL. More stringent site-specific objectives based on other beneficial uses.	Most RBs and states have the same MUN objective as the Central Valley RB. Some RBs and states do not allow discharges to increase the salinity of the source water. This typically results in implementation of site-specific objectives.
Chloride	Secondary MCL with recommended level of 250 mg/L and an upper limit of 500 mg/L.	Water quality objective for MUN beneficial use set at recommended secondary MCL. More stringent site-specific objectives based on other beneficial uses. Delta Plan (State Water Board) includes water quality objective of 150 mg/L at the Contra Costa Canal.	USEPA and most RBs and states have the same MUN objective as the Central Valley RB. Some RBs and states do not allow discharges to increase the salinity of the source water. This typically results in implementation of site-specific objectives.

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Total Nitrogen	No direct standard, nutrients cause algae growth leading to taste & odor/operational issues.	Objective for the MUN designation is 10 mg/L as N. There is also a narrative objective for biostimulatory substances.	USEPA adopted draft nutrient criteria for total nitrogen for most ecoregions in the U.S. for states to consider. These criteria are site-specific and are being applied by some RBs and states. The San Diego RB uses a ratio of 10:1 for nitrogen to phosphorus to set source water objectives (see total phosphorus). Some states have a similar narrative objective. North Carolina and Oklahoma have set criteria for response parameters, such as chlorophyll a.
Total Kjeldahl Nitrogen (TKN)	No direct standard, nutrients cause algae growth leading to taste & odor/operational issues.	No direct water quality objective. There is a narrative objective for biostimulatory substances.	No other RBs or agencies currently have a direct objective.
Organic Nitrogen	No direct standard, nutrients cause algae growth leading to taste & odor/operational issues.	No direct water quality objective. There is a narrative objective for biostimulatory substances.	No other RBs or agencies currently have a direct objective.
Nitrate	Primary MCL of 10 mg/L as N, Public Health Goal (PHG) of 10 mg/L as N.	Objective for the MUN designation is 10 mg/L as N. There is also a narrative objective for biostimulatory substances.	USEPA, RBs and other agencies have the same MUN objectives as the Central Valley RB.
Nitrite	Primary MCL of 1 mg/L as N, PHG of 1 mg/L as N .	Objective for the MUN designation is 1 mg/L as N. There is also a narrative objective for biostimulatory substances.	Some RBs and other agencies have the same MUN objectives as the Central Valley RB.
Ammonia	No direct standard, nutrients cause algae growth leading to taste & odor/operational issues.	There is a site-specific objective for ammonia in Tulare Lake Basin at 0.025 mg/L. There is also a narrative objective for biostimulatory substances.	USEPA and many RBs and agencies have adopted the criteria for fisheries, which are variable depending on pH, temperature and life-stage development. Site-specific criteria are developed for one-hour and four-day periods.

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Total Phosphorus	No direct standard, nutrients cause algae growth leading to taste & odor/operational issues.	No direct water quality objective. There is a narrative objective for biostimulatory substances.	USEPA adopted draft nutrient criteria for total phosphorus for most ecoregions in the U.S. for states to consider. These criteria are site-specific and are being applied by some RBs and states. Michigan has an effluent standard for point sources of 1 mg/L and Utah has a source water criterion of 0.05 mg/L. British Columbia limits total phosphorus in drinking water supplies to <10 µg/L. The San Diego RB has limits of 100 µg/L in streams, 50 µg/L in streams that enter a lake/ reservoir, and 25 µg/L in lakes/ reservoirs. Some states have similar narrative objectives. North Carolina and Oklahoma have set criteria for response parameters, such as chlorophyll a.
Dissolved Phosphorus	No direct standard, nutrients cause algae growth leading to taste & odor/operational issues.	No direct water quality objective. There is a narrative objective for biostimulatory substances.	USEPA has a water quality criterion for phosphate phosphorus, based on potential impacts to water treatment. This includes a limit of 100 µg/L in streams, 50 µg/L in streams that enter a lake/ reservoir, and 25 µg/L in lakes/ reservoirs.
<i>Giardia</i>	Treatment technique requires minimum of 3-log (99.9%) reduction (Surface Water Treatment Rule). Additional treatment based on source water quality, levels > 1 cyst/100 L or high surrogate levels.	No direct water quality objective. There is a numeric objective for indicator organism (fecal coliform) for the body contact recreation (REC1) beneficial use which may be indirectly protective of the MUN use.	No other RBs or agencies currently have a direct objective.

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<i>Cryptosporidium</i>	Treatment technique requires minimum of 2-log (99%) reduction, additional treatment based on direct measurement of source water for oocysts, levels > 0.075 oocysts/L (Interim Enhanced Surface Water Treatment Rule and Long Term 2 Enhanced Surface Water Treatment Rule [LT2ESWTR]).	No direct water quality objective. There is a numeric objective for indicator organism (fecal coliform) for the body contact recreation (REC1) beneficial use which may be indirectly protective of the MUN use.	No other RBs or agencies currently have a direct objective.
Total Coliform	Historically used as indicator organism for microbial risk. DHS had assigned a trigger threshold of 1,000 most probable number per 100 mL (MPN/100 mL) for advanced treatment. Unfiltered surface water supplies must have levels < 100 MPN/100 mL.	There is a water quality objective for groundwater sources, < 2.2 MPN/100 mL, for the MUN designation.	San Francisco Bay and Santa Ana RBs have objectives of 100 MPN/100 mL for MUN designated surface water sources. These objectives have no practical application at this time. Oklahoma limits MUN sources to 5,000 MPN/100 mL. Massachusetts limits unfiltered drinking waters supplies to 100 MPN/100 mL. Most RBs also have an objective for MUN designated groundwaters to have non-detectable total coliform. Some states and other countries have set objectives/criteria for MUN supplies which vary, based on the amount of treatment provided for the drinking water.

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Fecal Coliform	Used as a more specific indicator for fecal contamination. DHS has assigned a trigger threshold of 200 MPN/100 mL for advanced treatment. Unfiltered surface water supplies must have levels < 20 MPN/100 mL.	There is a numeric water quality objective for REC1 beneficial use. Based on a minimum of 5 samples in a 30 day period, the geometric mean shall be < 200 MPN/100 mL, nor shall more than 10 percent of samples exceed 400 MPN/100 mL. There is also a more stringent site-specific objective for Folsom Lake.	The USEPA water quality criterion for bacteria for the REC1 beneficial use is the same as the Central Valley RB objective. Massachusetts limits unfiltered drinking waters supplies to 20 MPN/100 mL. Kansas has variable criteria, based on season and stream classification. New Jersey requires all MUN groundwater sources have non-detectable fecal coliform. San Francisco Bay RB has an objective of 20 MPN/100 mL for MUN designated surface water sources. This objective has no practical application at this time. Some other RBs and states still use the fecal coliform criterion, but some have moved to the <i>Enterococci</i> and <i>E. coli</i> criteria shown below, as recommended by USEPA.
<i>Enterococcus</i>	Used as a more specific indicator for fecal contamination. DHS/USEPA recommend use of this surrogate for ocean source waters.	No direct water quality objective.	USEPA water quality criterion for <i>Enterococcus</i> for REC1 use is a geometric mean of 33 MPN/ 100 mL, with variable maximum levels based on the intensity of use of the waterway.
<i>E. coli</i>	Used as a more specific indicator for fecal contamination. DHS/USEPA recommend use of this surrogate for fresh source waters. USEPA has assigned trigger levels for small systems to require <i>Cryptosporidium</i> monitoring under the LT2ESWTR; 10 MPN/ 100 mL for reservoirs and 50 MPN/100 mL for streams.	No direct water quality objective.	USEPA water quality criterion for <i>E. coli</i> for REC1 use is a geometric mean of 126 MPN/ 100 mL, with variable maximum levels based on the intensity of use of the waterway. Utah has also set a criterion for <i>E. coli</i> for MUN supplies at a geometric mean at 206 MPN/100 mL with a maximum of 940 MPN/100 mL.